

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) An automatic control device, comprising
input means for inputting samples comprising measured values of cyclic voltage and/or current ~~with a defined nominal frequency;~~
computing means for computing a parameter on the basis of said samples, and for comparing the computed parameter to a predefined condition; and
initiating means for initiating a control function in response to the parameter meeting the predefined condition;
said input means being arranged to input a predefined number N of samples per one cycle ~~of the nominal frequency;~~ and said predefined number N being a power of two;
said computing means being arranged to compute the parameter with a discrete Fourier transform algorithm optimized on the basis of fixed coefficients that corresponding correspond to said predefined number N of samples per cycle of the nominal frequency; the optimization on the basis of fixed coefficients comprising:
determining for the discrete Fourier transform algorithm a group of discrete values each discrete value being a result of multiplication with a coefficient that varies according to a sine or cosine function of an integer value multiplied with a quotient of full cycle and said predefined number N of samples per one cycle, the

integer value ranging up to the predefined number N of samples Per one cycle;

determining zero coefficients that by the choice of said predefined

number N of samples per one cycle fix to zero;

determining multiplication coefficients the value of which by the choice

of said predefined number N of samples per one cycle fix to 1 or 0-1;

eliminating calculations involving zero coefficients; and

replacing calculations involving multiplication coefficients by use of

corresponding minus and talus signs.

2. (Cancelled)

3. (Currently Amended) An automatic control device as claimed in claim 1, wherein said predefined number is 32.

4. (Cancelled)

5. (Cancelled)

6. (Previously Presented) An automatic control device as claimed in claim 1, wherein in said optimized Fourier transform algorithm two or more multiplications by a fixed coefficient have been combined into a sum equation.

7. (Previously Presented) An automatic control device as claimed in claim 1, wherein in said optimized Fourier transform algorithm samples and coefficients are

brought to integer form by multiplication by a value that is fourteenth power or higher of two.

8. (Currently Amended) An automatic control device as claimed in claim 1, wherein said computing means are arranged to compute a parameter that is one of the following: root-mean-square current, power factor, power factor-sign indication on a capacitive or inductive nature of a coupling, distortion, and earth fault current.

9. (Currently Amended) An automatic control device as claimed in claim 1, wherein the automatic control device is an electric protection device and said control function comprises isolation of a second device from ~~the~~ an electric line.

10. (Currently Amended) An automatic control device as claimed in claim 1, wherein the automatic control device is connected to a generator ~~(40)~~ feeding ~~the~~ an electric line ~~(42)~~ and said control function comprises adjustment of the operation of said generator.

11. (Currently Amended) A method for automatic control of an electrically operated device, comprising:

inputting a predefined number of samples comprising measured values of cyclic voltage and/or current ~~with a defined nominal frequency~~;

computing a parameter on the basis of said samples;

comparing the computed parameter against a predefined condition;

initiating a control function in response to the parameter meeting the predefined condition;

fixing the number N of samples input per one cycle, the number N being a power of two of the defined nominal frequency; and

computing the parameter with a discrete Fourier transform algorithm optimized on the basis of fixed coefficients that corresponding correspond to said predefined fixed number N of samples per cycle of the defined nominal frequency.

the optimization on the basis of fixed coefficients derived by:

determining for the discrete Fourier transform algorithm a group of discrete values, each discrete value being a result of multiplication with a coefficient that varies according to a sine or cosine function of an integer value multiplied with a quotient of full cycle and said predefined number N of samples per one cycle, the integer value ranging up to the predefined number N of samples per one cycle;

determining zero coefficients that by the choice of said predefined number N of samples per one cycle fix to zero;

determining multiplication coefficients the value of which by the choice of said predefined number N of samples per one cycle fix to 1 or -1;

eliminating calculations involving zero coefficients; and

replacing calculations involving multiplication coefficients by use of corresponding minus and plus signs.

12. (Previously Presented) A computer program product, executable in a computer, wherein execution of the computer program product in the computer causes the computer to carry out the steps of claim 11.

13. (Previously Presented) An automatic control device as claimed in claim 2, wherein in said optimized Fourier transform algorithm calculations involving coefficients fixed to zero have been eliminated.

14. (Previously Presented) An automatic control device as claimed in claim 13, wherein in said optimized Fourier transform algorithm multiplication by fixed coefficients 1 or -1 are avoided by use of signs.

15. (Previously Presented) An automatic control device as claimed in claim 14, wherein in said optimized Fourier transform algorithm two or more multiplications by a fixed coefficient have been combined into a sum equation.

16. (Previously Presented) An automatic control device as claimed in claim 15, wherein in said optimized Fourier transform algorithm samples and coefficients are brought to integer form by multiplication by a value that is fourteenth power or higher of two.

17. (Previously Presented) An automatic control device as claimed in claim 16, wherein said computing means are arranged to compute a parameter that is one

of the following: root-mean-square current, power factor, power factor sign, distortion, and earth fault current.

18. (Previously Presented) An automatic control device as claimed in claim 17, wherein the automatic control device is an electric protection device and said control function comprises isolation of a second device from the electric line.

19. (Previously Presented) An automatic control device as claimed in claim 18, wherein the automatic control device is connected to a generator feeding the electric line and said control function comprises adjustment of the operation of said generator.

20. (Previously Presented) A computer program product according to claim 12, wherein said predefined number is a power of 2.